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UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

COMBINED MONTHLY REPORT OF THE OFFICES OF

FOREST EXPERIMENT STATIONS
GRAZING RESEARCH
DENDROLOGY
ECONOMICS
PRODUCTS

MAY, 1926.

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COMBINED MONTHLY REPORT

BRANCH OF RESEARCH

MAY, 1926

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G E N E R A L

Beginning with the current issue, the Monthly Reports of the various activities of the Branch will be combined under one cover with the exception of the report from the Forest Products Laboratory. Such a combination is highly desirable from many standpoints, as it will give in one place a general picture of our progress and development instead of scattered, separate reports for different units, and will permit building a current history of our Forest Service research.

To issue this report each month with the minimum amount of delay requires the cooperation and help of each unit of the Branch concerned. There should be but little delay in submitting the summary of the monthly activities promptly to Washington and the tenth of each month has been set as the dead line for material to be included. Each unit should so arrange its work that the report may be in Washington by the 10th of each month. Those reports received too late to go in the current publication will appear in a subsequent issue. Because of failure to receive reports promptly, this issue appears without a statement from the Products offices in Districts Five and Six, ~~and without anything from Forest Economics.~~

Dendrology

Federal Horticultural Board Activities

With the comparatively recent development of cotton culture in the agricultural valley sections of Arizona, a new very destructive native cotton insect, the Thurberia Weevil, has appeared in cotton fields of Arizona. This insect has been known for a number of years to be confined to a wild species of cotton growing naturally in remote mountain sections of southern Arizona, to which cultivated cotton fields have now approached so close that the weevil has infested some 15,000 acres of cotton. It has shown a remarkable ability quickly to attack a new host plant, the closely related cultivated cotton. It is regarded as the most dangerous cotton pest yet encountered in the western districts, and unless exterminated or controlled it threatens to invade the cotton-growing districts of Oklahoma, west Texas, Arizona, and California.

The Federal Horticultural Board recently held a public hearing to consider establishing a quarantine to control this pest.

FOREST EXPERIMENT STATIONS

A Convenient Test for Soil Reaction

A. E. Wackerman, Lake States

A very convenient method of determining the degree of acidity or alkalinity of soils has been used in some preliminary observations in peat swamps in the Lake States. The outfit is enclosed in a cardboard container 4 inches long and 2 inches in diameter with a metal screw cap and consists of a collapsible tube containing the indicator solution, a number of waxed papers, and a color scale.

In making the determination, one of the waxed papers is folded and a sample of the soil, water, or other substance to be tested is placed in it. A few drops of the indicator solution is then squeezed from the tube on to the sample and after one minute, the color of the clear indicator solution indicates the degree of acidity or alkalinity of the sample.

The color range is from deep blue for an alkaline sample to bright orange for a very strongly acid sample. This is a pH range of from 7.0 to 4.9.

This test does not compare for accuracy with more elaborate or refined methods of hydrogen-ion determination, but it does afford a convenient and fairly accurate method of making acidity tests in the field because the outfit is not fragile and may be carried in a pocket.

Each outfit (called Soiltex), will make from 75 to 100 tests and it costs 75¢ in individual lots; when 10 or more are purchased the price is 65¢ each. It is manufactured by the Soiltex Company at Lansing, Michigan.

Soiltex has proven useful, in so far as we have applied it, in measuring the acidity of soils, both mineral and organic. It has been used extensively by the Michigan Land Economic Survey and the Division of Soils of the University of Minnesota considers Soiltex as a good field method for determining soil reaction.

Washington

General

Beginning about the middle of May there was a general shake-up in the arrangement of rooms and those familiar with the old arrangement in the Atlantic Building will find themselves now more or less bewildered without a guide. The Branch of Research has been congregated on the sixth floor as far as possible so that there is less lost motion in the Branch and greater unification of work. Forest Measurements and the Library remain in their original quarters on the fourth and second floors, respectively.

The middle of May, Ward Shepard, who has been the Assistant Chief of the Branch for several years, transferred to Public Relations. His place as Assistant Chief of the Branch is to be filled by the transfer of R. E. Marsh, Assistant District Forester in Charge of Forest Management in the Southwestern District. Mr. Marsh will not arrive in Washington until late in the summer.

Legislation

Congress still remains in session at times considering legislation of interest to the experiment stations. The Senate passed the Reed bill (S. 2516) for the Middle Atlantic States Forest Experiment Station on May 11, the bill going to the House Committee on Agriculture. On May 20 the Senate Committee on Agriculture reported out favorably the bill by Senator Fess (S. 3405) for an Ohio-Mississippi Valley Forest Experiment Station. This passed the Senate on June 3. A hearing on this and on the Middle Atlantic States Station bill resulted in a favorable report on both bills by the House Committee on Agriculture on June 8.

Two new experiment station bills were introduced in the House during the month, one by Senator Fletcher (S. 4212), providing $50,000 for naval stores investigations at the Southern Forest Experiment Station and the Forest Products Laboratory, and one by Representative Johnson (H. R. 12335), providing $50,000 for the enlargement of the Northern Rocky Mountain Forest Experiment Station.

Another bill of general interest is S. 1640, providing for $300,000 "that the Secretary of Agriculture may establish and maintain a park and national arboretum for recreational purposes and for purposes of research and education concerning tree and plant life." This has passed the Senate and is now in the House Committee on Agriculture.

New Appointments

Two members from the junior forester eligible list have been selected for forest experiment station work: H. W. Siggins, from the University of California, assigned to the California Experiment Station, and Ivan H. Sims from the University of Michigan to the Appalachian Forest Experiment Station. The appointments of both men become effective on July 1. L. I. Barrett, junior forester from District 6 on leave this year at the University of Michigan, has been reappointed at the Southern Station.

The announcements for the Forest Ecologist examination were widely distributed during the month and many inquiries received. This seems to indicate that a considerable number plan to take the examination.

Section of Forest Measurements

During May, Reineke visited the Southern and Appalachian Experiment Stations and returned to Washington early in June. After cleaning up a number of odd jobs and going over parts of the manuscript on Statistical Methods with Bruce, Reineke will leave for an extended trip to the West, chiefly on the western white pine yield study at the Northern Rocky Mountain Forest Experiment Station. Bruce returned to the Forest Service on June 1, and will devote considerable time this summer to the development of statistical work, the completion of a manuscript on statistical methods, and on the possibility of the International log rule in the timber industry.

The time of those in Forest Measurements was spent in numerous activities, such as checking manuscripts, the Douglas fir yield study, checking scale books, and the western yellow pine regional volume table study. The latter now is approaching completion.

The Tabulating Section devoted most of its time to Accounts, which have been badly in arrears on account of the volume of urgent station work earlier in the year.

Library

In May the library loaned out 966 books and periodicals, and 109 members of the Service and others consulted the library in person. There were 302 books and articles indexed for the catalogue during the month.

"CLEAR, EFFECTIVE WRITING"

The duodecalog elaborated here last month may have seemed an effort to discourage rather than encourage the scientific writer. "If to escape editor Scylla we must be whirled about in a Charybdis of rewritings and revisions before submitting the manuscript at all, what hope is there?" It may as well be confessed that the editor has no slightest notion that anyone

in the field or in Washington is going to prepare a manuscript in the manner indicated last month. Few have the patience and none have the time for such elaborate preparatory work. What is the next best thing?

My notion is that the next best thing is making the most of editorial assistance. And that is quite an art in itself, but one worth cultivating for several reasons. In the first place, editors are unavoidable, if you are going to publish the results of your work in Government bulletins and circulars. Removing the proximate editor, only shifts the field of conflict to the office of the editor next in line. In the next place, editorial revision gives you in a measure what you can never get direct in this work, the reaction of the reading public to your work. It is less immediately painful to hurl an unedited bulletin out into the void of wholesale distribution; but the end cost is like to be far greater. A third very potent reason is that with each thoroughly, even harshly edited bulletin you are the gainer in added experience and freedom from some of the faults that have been hampering your free expression.

The art of making the most of editorial assistance consists primarily in assuming that the editor, however mistaken he may appear to be, is your friend and not your enemy. Any editor who thinks he has anything to gain by changing your way of saying things merely to suit his own preferences, or to show some superior official that he is a power with the blue pencil, is no editor at all, but a meddler. The editor who has any right at all to the name is constantly trying his best to help you to do better work which will gain credit for you and noneeat all for him.

Naturally, you feel that the report you have spent long hours on is "good enough." You feel that it says what you want it to say, in the way you want to say it; your fellow workers have read it over and said it was good; your friends and possibly even the family have found no fault with it; every day you read worse things written by other fellows. And here the manuscript comes back from Washington, all chopped up and switched around, with apparently everything shot to pieces from title to illustrations. It is right there that the art of making the most of editorial assistance needs most to be applied and is most difficult to practice.

A very useful expedient is to read through the criticisms and revision as far as you can without blowing out a cylinder head, and then to stuff the whole thing away out of sight for two or three days, until you feel that you are calm enough to look it over again with no more than a slight curl of the lip and a few minor oaths. At all events, the temptation to sit down and tell the editor in detail just why he is unspeakably wrong in every instance should be sternly resisted. Or, if this is impossible, the letter or memorandum containing this attack upon the editorial epidermis should be carefully torn up and dropped in the wastebasket. The reason is because the editor is your friend, not your enemy. He can't help being disillusionizing and disappointing; that is his business--at least, when illusions and hopes are built upon writing that is not yet clear and effective.

Whether the editor merely states his mind and leaves it to you to rebuild your manuscript accordingly, or whether to save your time and relieve you of the weariness of reworking old material he revises your work himself to some extent, he is trying to help you. Not all of his attempts may be helpful, some may be mistaken; but in the main your work will be the better for his assistance. That is what he is there for. The more freely you accept his help, the less you are going to suffer from his ministrations in the future.

Appalachian Forest Experiment Station

In preparing plans for the summer field work, arrangements have been made for the employment of a number of temporary field assistants and for several permanent additions to the Station staff. These will be reported later, as they arrive at the Station. It is planned to have parties in the field during the summer season, making studies of fire damage, growth and yield of oaks, and methods of cutting.

The first part of the month was unusually dry, causing severe fires in the Southern Appalachian region, notably in the vicinity of Grandfather Mountain on the Pisgah National Forest. After an exceptionally dry period of about ten days a fire, previously controlled, escaped or was reset. This is particularly interesting, since the burn included an area on Headquarter Mountain, which had been burned previously and was examined by a party from this Station in 1922. The reburn will be reexamined this year.

The precipitation for May, normally about 3 in., fell short of this by $1\frac{1}{4}$ in. of rainfall for this season, giving a deficiency for the year of 4 in. This condition, combined with the extreme deficiency of 1925, will make the drought study observations started last year especially valuable.

Among the out-of-town visitors at the Station during the month were: Dr. F. A. von Monroy, a German forester, studying in America under the auspices of the Rockefeller Foundation. We also received a visit from Dr. D. T. McDougal, who accompanied Dr. Craighead to Asheville to look over the experimental work being carried on by the Office of Forest Entomology at the Bent Creek laboratory. Two of Dr. McDougal's dendrographs are in operation at Bent Creek.

Frothingham finished the revision of the report on Southern Appalachian forest types and submitted it to members of the Committee of the Southern Appalachian Section of the Society for comment.

In addition to the planting on Mount Mitchell reported for April some 500 trees which arrived too late for transportation to Mount Mitchell were planted on the experimental area at Bent Creek. On the evening this work was completed a rainfall of slightly more than 2 inches occurred at Bent Creek, being recorded in two separate rain gauges. For the same period the rainfall in Asheville, only ten miles distant, was only one inch.

Korstian completed his thesis on the germination and early survival of oaks and will return to the Station the end of June. Several lots of acorns stored at the Bent Creek station in connection with this study, which were covered with leaf litter during the winter, showed excellent germination, while similar lots of acorns protected from rodents but not covered by leaf litter, showed practically no germination. The successful establishment of oak seedlings seems to depend upon protection--from insect injury, from rodent injury, and from injury due to freezing and drying when exposed on the surface of the ground.

The forest entomology projects for 1926 are mainly a continuation of those started last year, namely, the effects of environmental conditions upon the growth of pine trees and their attractiveness, under certain conditions, to the southern pine beetle. Dendrographs have been set up on trees on both the drought and check plots. Hygrothermographs and rain gauges have been placed on sites with northerly and with southerly exposures. In addition, soil temperatures are being taken at various depths where moisture determinations are made. Sections of the wood phloem and leaves are being studied to determine the moisture relation of the tree to insect attack. Up to the present time no outbreaks of the southern pine beetle have occurred, although a light flight is indicated by the emergence of beetles from the cages and the presence of others attracted to these cages from the outside. The first beetles were observed on May 15. The beetles which were caged on living trees on the drought plot in September, 1925, were successful in inducing an attack along the stem outside of the cage and also on two adjacent trees, but none of the broods were successful in developing and no blue stain was present this spring on these trees. However, the foliage is off color and the phloem dead in streaks.

On May 18, J. A. Beal reported for duty at Washington, where the season's work was discussed with Dr. Craighead.

On May 24, Beal and St. George left Asheville for Dublin, Georgia, to examine for the Wrightsville and Tennille Railroad several tracts of timber which had been affected by a combination of factors, such as drought, fire, turpentining, and insects. Examination of the cores of several living trees revealed that there was very little growth during 1925. Plots that had not been turpentined or burned contained many dead trees, indicating that the drought had a marked effect upon their growth and subsequent attack by bark beetles of the genus Ips. None of the southern pine beetles were present in any of the trees, though all of the dead trees had been attacked. The trees appeared to be in somewhat the same condition and infested by the same insects as the trees that died in such large numbers during the recent drought which extended from Alabama to Texas.

Dr. George C. Hedgcock has been appointed temporarily as Station Pathologist, effective May 11, to fill the vacancy caused by the resignation of Dr. C. J. Humphrey.

Southern Forest Experiment Station

Visitors to the Station included Dr. F. A. von Monroy of Schwerin, Mecklenburg, Germany, who is making a study of logging and mill machinery in this country.

Bynum Wood, a 375-acre hardwood tract near Colfax, Grant Parish, Louisiana, that a recent bill introduced in Congress, proposes to purchase for a combined national park and forest experiment station, was visited by Forbes. Here he found an excellent stand of virgin hardwoods with but slight culling and little grazing. Many species were noted, some of the trees attaining a height of over 150 feet, and diameters up to 5½ feet.

The Florida National Forest was tentatively selected as headquarters for one an additional branch station; no definite decision was reached as to the location of the other two.

Forbes attended the annual meeting of the Southern Cypress Association where he discussed with Mr. J. W. Tucker of our Advisory Council the advisability of expanding our work into the hardwood and cypress types. Mr. Tucker felt that our efforts should be concentrated on the pine types for the present.

The work of mapping seed trees around the Pa-1 McNeill quadrats was continued by Wakeley and Reineke during a week between extensive survey trips. Reineke also assisted Wakeley in burning one of the longleaf seasonal burning plots at McNeill.

Hadley spent the entire month in the office on his reproduction project. Longleaf seedlings from 1924 seed crop, followed through the first season after germination, on the various conditions of fire, grazing, and competing vegetation, have made possible many very interesting and definite correlations.

Demmon left early in the month for south Georgia to do preliminary scouting for our extensive survey work to be concentrated in that locality during the month. Wyman, Wakeley, and Reineke joined him a few days later and the party proceeded to squeeze information from several interesting areas. They received valuable assistance from Mr. A. K. Sessoms, owner of 80,000 acres of protected second-growth timber near Waycross, Georgia, and Capt. I. F. Eldredge, Forest Manager for the Superior Pine Products Company of Fargo, Georgia, practicing forestry on 187,000 acres. The surveys yielded information on fire and turpentine damage, root competition as affecting reproduction and distance of seeding.

Northeastern Forest Experiment Station

Behre spent some time familiarizing himself with the permanent sample plots which have been under observation in New England for twenty years. Meyer remeasured these plots last year, and in order to insure the continuity of the record and to take advantage of his knowledge of the plots, he and Behre spent about a week in the field in inspecting them, before Meyer's departure for the Northwest. Behre spent another week in going over the sample plot records for the region with a view to compiling the data during the coming year, and planning further silvicultural operations on several of the plots.

Behre also spent several days checking over the plots on Mount Toby, which were established for a study of the development of a pine plantation with an understory of hemlock left after removal of hardwoods.

With the exception of the sample plot work, Meyer spent the month in getting his manuscript on spruce and fir yields into final shape, and in closing up his projects preparatory to leaving for the Pacific Northwest Forest Experiment Station.

Westveld spent a few days on the Mount Toby College Forest where a number of experiments are being conducted in cooperation with the Massachusetts Agricultural College. Some work was done in connection with the study of the development of a Scotch pine plantation which was initiated to determine the relative desirability of stock raised from Austrian, Scotch pine and Baltic Scotch pine. Two-year-old seedlings were planted two years ago, and although the survival has been equally good in both species, the Austrian Scotch pine is much more vigorous than the Baltic.

The Harvard Forest station for the study of fire weather conditions was established early in the month, and the day of its lowest humidity record was marked by a serious fire in that region. The Cranberry Lake Station in the Adirondacks will be established early in June.

Spaulding addressed the Connecticut Forestry Association at Litchfield on the future of the chestnut early in the month. He spent a few days with MacAloney in the Harvard Forest in laying out experiments in screening slash of white pine, pitch pine, and spruce; made two trips on sweet fern-pitch pine rust; and filled in with studies of wood-rotting fungi.

Lake States Forest Experiment Station --April-May

During April the efforts of the Station were largely directed toward winding up the reports on which it had been working during the winter.

The field work was started about May 1. Mitchell is around Bemidji on a cooperative fire study with the State Forest Service. The spring is decidedly dry and late and fires very numerous. This afforded Mitchell the opportunity for which he was looking for two years of determining the effect of different factors on fire hazard. A large number of instruments were used over a limited area. Wackerman is in the field with a party of engineers working on a plan of drainage for swamp forests on the Cloquet Forest and the Minnesota National Forest.

A large number of people visited the Station, among them Dr. I. W. Bailey, Paul G. Redington, Fred Ames, W. H. Gibbons, R. C. Hall, and others. In connection with the visit of Mr. Hall, the Station made arrangements for providing accommodations to some seven people who may come to Minnesota on the forest tax study.

Southwestern Forest Experiment Station

The month of May opened unusually wet, the ground being too soft to travel by automobile off the main highways. According to previous experience this late moisture should result in good height growth in yellow pine seedlings, providing that low temperature does not retard the growth until the moisture is gone. The extremely open winter resulted in a heavy loss by frost heaving. Many seedlings a foot high are lying flat on the ground or are standing with the upper portion of the root system exposed.

Messrs. Carter, Rachford, Hill, Pooler and Marsh spent a good portion of the month on the Coconino. They visited the experiment station and a number of the fenced sample plots demonstrating the possibilities of natural reproduction with sheep grazing eliminated.

A series of thinning plots was established on the Sitgreaves in cooperation with local Forest officers. The area selected lies in the Decker Wash section. It is stocked with western yellow pine seedlings of 1914 germination at the rate of from 40,000 to 60,000 per acre. The seedlings are from 2 to 4 feet tall and are beginning to show signs of crowding. A plot of .6 acre was divided into four blocks, one of which was left as a control and the other three thinned to spacings of two, three and four feet respectively. Another thinning in from five to ten years is contemplated. The grass is at the point of being killed out on most of the area. It is anticipated that the grass will revive in the heavier thinnings. If this takes place it will tend to offset the benefits of wide spacing.

Mr. Horn of the Biological Survey is continuing his studies of the porcupine. Experiments during the past month explain why it has been almost impossible in the past to poison porcupines. Strychnine taken into the stomach in moderate doses is rendered ineffective by the tannin in the bark and needles of the pine. Tests have shown that a porcupine will rarely eat enough bait at one time to get a killing dose. Apparently if poisoning is ever successful a poison other than strychnine will have to be used. A study of the movements of porcupines indicates a migration from the yellow pine to the woodland in autumn and a return to yellow pine and higher altitudes in spring. These migrations seem to take place along rather definite routes, usually along ridges. In the past two years, some 300 animals have been killed for scientific purposes. It would seem that a trained hunter devoting his entire time to this work should be able to reduce the numbers effectively over a large territory in the course of two or three years.

Northern Rocky Mountain Experiment Station

The outstanding event of the month was the cooperative project between the Experiment Station and the forestry school of the University of Idaho. This covered a two weeks' field trip of the senior class to the Priest River Station to carry out under our direction an intensive program of field instruction in forest investigations and timber sale practice. A detailed working plan for the project was prepared by the Station in cooperation with Dean Miller. The objects were: (1) to give the students practice in the most useful forms of field technique in forest investigations and timber sales work; (2) to accomplish certain needed work for the Experiment Station; (3) to try out the Forester's suggestion at the Denver Conference that demonstration forests at experiment stations should supply one form of personnel training in the Forest Service.

The Idaho party included Dean Miller and 11 students. Instruction in the investigative work was carried out by Dean Miller and three members of the Station staff: Kempff, Gisborne and Haig. Weidman was present for a few days to start the project. Instruction in marking, slash disposal and inspection of timber sales was guided by Supervisor Whitham and three of his staff from the Kaniksu Forest. Except for briefly outlining the program and its purpose, there were no lectures. The purposes and methods of each individual project undertaken in the field were explained on the ground. Instruction was by actual performance of the job under the intensive supervision of the staff.

The program was briefly as follows: 1 day showing the party the main experiments underway on the demonstration forest; 2 days establishing permanent yield plots in white pine and Douglas fir stands; $2\frac{1}{2}$ days marking, felling and slash disposal on thinning plots; 1 day on a study of reproduction following forest fire; 1 day conducting a reproduction and seed tree study on an old timber sale; $\frac{1}{2}$ day on fire studies; $\frac{1}{2}$ day on office methods in yield and reproduction studies; $2\frac{1}{2}$ days on marking, slash disposal and inspection of timber sales on the Kaniksu Forest.

Although the emphasis in this course of field training was on investigative methods and purposes rather than on the labor and routine of research, the Experiment Station really got a satisfactory return in studies and experiments actually accomplished. Four 1/8-acre yield plots and two thinning plots somewhat larger in size were established - all of which had been on our regular program for some time. The reproduction study of a portion of the Experiment Station burn (40 chains of strip and 76 quadrats) gives us our first data on the character and rate of restocking on this area. The study of reproduction and seed trees following cutting was made on one of the regular cut-over areas listed for study by Haig this summer. This day's work gave us three lines across the area and yielded 90 quadrats and increment borings from 75 seed trees. Although no direct return came from the instruction in fire studies, it is believed the value of this will be felt in a more intelligent understanding and action on the part of the men when they get into the Forest Service. In this work

the students were individually instructed in the use of meteorological instruments, especially the sling psychrometer; determination of fuel moisture content by oven drying and duff hygrometer; plotting daily records of relative humidity, temperature, precipitation and duff moisture; and interpretation of weather forecasts in the light of forest fire conditions. In the timber sale marking the men were given marking axes and organized into small crews under the supervision of experts from the timber sales personnel of the Kaniksu Forest. Supervisor Whitham cooperated splendidly in this phase of the work.

Although the Station put in some hard work preparing for and actually carrying out this project, it is felt that it was very much worth while. It is believed also that the experience indicates what can be done at an experiment station in the way of personnel training in investigative methods and thinking, and in the application of silvicultural principles.

Before leaving for the field on the above project the members of the staff completed office work on their several studies. Marshall cleaned up the various jobs he was engaged on before leaving early in the month for three months' furlough required for treatment of ulcer of the stomach. Word from him at a hospital in New York City states that he is in the midst of the first stage of the treatment and is getting along normally.

Wahlenberg spent three weeks with Planting Chief Olson on a field trip through eastern Montana. They inspected the principal plantations which had been made in that region before planting east of the Continental Divide was abandoned about 10 years ago. Plantations were examined on the Madison, Helena, Deerlodge, and Jefferson Forests. Most of the projects were complete failures. Drought and grass competition, etc., are the factors that are commonly held responsible for losses in these plantations. No doubt drought has killed many planted trees in this part of the state, as it continues to do in the white pine region, but early records were not thorough enough to exclude the possibility of other primary causes of loss. Judging not only from the opinions of forest officers now administering these areas, but also from conversations with old-time residents near these plantations, grazing has caused heavy losses. One rancher told of cut fences when range feed became scarce, and subsequent browsing in a plantation. Local Forest officers now admit that trampling and rubbing have done much damage.

On the Madison no living trees were found on the old planting areas. On the Helena about two dozen yellow pines and half as many lodgepole pines were found which had survived planting. On the Deerlodge two groups of small plantings by various methods were found that were exceptionally successful in spite of rocky soil. It seems that only a favorable moist season following planting can account for the present stand of about 400 trees per acre in some plots. Unfortunately, porcupine damage during the past year or two has been heavy and it looks as if the plantations would be destroyed unless effective measures can be taken against the "porkies."

On all three of these Forests the sites selected for planting were grassy parks bordering the true timber type. It is natural that survival should have been low in these parks because of heavy grazing and the lack of any shade or shelter from older forest growth. On the other hand, excellent results were obtained on the Jefferson Forest where burned areas in the timber type were planted. Here a 660-acre plantation of 1-1 western yellow pine (from Helena seed) showed good survival, about 184 trees per acre. "Red belt" or climatic injury was universal but few trees were killed by it. The numerous standing snags indicated rather stunted trees, few of which would yield more than one log had they lived. Because of this and the well scattered natural reproduction of Douglas fir on the area, the selection of this site for planting, although more fortunate than most, could hardly be justified under our present planting policy which considers the prior needs of Idaho and western Montana.

Wahlenberg and Olson extended their trip into North Dakota, chiefly to visit the Northern Great Plains Field Station at Mandan. This agricultural experiment station has been cooperating with farmers in the establishment of windbreaks and shelterbelts in the plains region since 1916. Examples of successful plantings may be found in many counties, but as yet the majority of farms are badly in need of windbreaks. The purpose of the Mandan station is to experiment with planting material and to demonstrate the value of planting to the people, rather than to supply the needed stock. The demand for material will ultimately be met by private nurseries and by the new state nursery at Bottineau operating under the Clarke-McNary law.

Trees which have clearly demonstrated their usefulness for windbreak planting in this region are the Siberian pea tree (Caragana arborescens), Green ash (Fraxinus pennsylvanica lanceolata), box elder (Acer negundo), northwest poplar (believed to be a cross between Populus deltoides and P. balsamifera) and the Black Hills variety of white spruce (Picea glauca albertiana). Other shrubs and trees that have not been so thoroughly tested as yet, but which give promise of success are: Russian olive (Elaeagnus angustifolia), Buffalo berry (Sheperdia argentia), American elm (Ulmus americana), chokecherry (Prunus virginiana), wild plum (Prunus americana), Jack pine (Pinus banksiana), western yellow pine (Pinus ponderosa), Scotch pine (Pinus sylvestris), Rocky Mountain red cedar (Juniperus scopulorum), and blue spruce (Picea pungens). Species that have been found ill suited to general planting are the Norway and Carolina poplars and the Russian, golden, and Laurel-leaf willows. (The author probably refers to the northeastern hybrid, a cross between Populus deltoides and P. balsamifera.--G.B.S.)

The Mandan station requires of its cooperators that the land to be planted be maintained in clean summer fallow one year previous to planting. After planting the trees are cultivated but not watered and inspections are made the first, fifth, tenth, and fifteenth years. By these methods reliable information concerning the hardiness and growth of numerous trees and shrubs is being compiled - information that can be used later by farmers who contemplate planting woodlots.

A side trip was made to Bottineau, North Dakota, in order to see the state nursery and examples of shelterbelts in Bottineau County. These and also the naturally wooded area of the Turtle Mountains were seen in company with Mr. F. E. Cobb, state forester. These so-called mountains are low, rolling hills covering several square miles along the Canadian border. Like the groups of hills forming the Sioux division of the Custer National Forest, these hills are a remnant of the ancient Missouri Plateau that formerly covered the entire region. Unlike the Sioux, however, the natural forest cover is a dense growth of hardwoods, consisting of poplar, green ash, burr oak, white birch, aspen, and elm. All of the area has been cut over and has sprouted profusely. Although the trees are scrubby in form, they are a valuable source of posts and poles for the farms. The water levels of several lakes in these hills have been lowered several feet following unrestricted cutting and fires in the woods during recent years. The land is privately owned and the state has no authority to act in case of fire.

California

Almost all the month of May has been devoted to the methods of cutting study, excepting time required for necessary routine.

Wieslander arrived May 17 and has been busy becoming familiar with the new work of the Station.

Rocky Mountain Experiment Station

One-half of Bates' time during May was spent at the Forest Products Laboratory Program conference, as a representative of the Experiment Stations. This opportunity to go into the work of the Laboratory in detail was extremely illuminating, and is one which every Experiment Station man should welcome. It was surprising, in the first instance, to note the extent to which the fundamental properties of wood were being studied,- facts which seem to be seldom mentioned in the routine Laboratory reports. And in the second instance it was encouraging to one who has rather stressed the fundamentals of silvicultural research to note how closely the two lines are drawing together, how many problems they have in common, or bearing one upon the other. The feeling was acquired that to study wood one must first know a good deal about the conditions under which the tree existed as a living organism; likewise that the behavior of the living tree can in many essential respects be expressed in terms of the physics and chemistry of the main product of its activities. The time seems not far distant when the Laboratory ceases to be strictly a "Products Laboratory," and becomes a "Forest Research" laboratory, merging the many joint problems of production and utilization, and being able to tell the landowner, private as well as governmental, how to grow not merely wood, but wood of certain definite mechanical, physical, and chemical properties as needed in the arts. And here also, Forest Economics enters in, for it must be a definite part of the whole program to study the trend of the needs of our civilization. Is this trend governed largely by the character of natural resources available, or does civilization develop definite needs largely determined by human desires?

Returning to Colorado Springs, Bates has been largely engaged in reshaping a policy for the summer, based on the necessity for dropping the proposed Black Hills development work because of lack of funds. The time seems opportune to catch up a number of loose ends at the Fremont Laboratory, which have been largely neglected during the past two or three busy field seasons. This is especially true of the soils work, in which preparations are being made for a more exhaustive attack on the chemical relations. A beginning has been made, and probably most of the summer will be spent in this way, making possible a thorough progress report on the study of soils properties in relation to growth. In a way representing at least a temporary retrenchment in our ambitious and broad program, this step is also in line with the clean-up policy which has been followed for several years in the effort to keep results reported up to date and to strike a proper balance between field and office work.

Roeser has spent the entire month at the Laboratory on a dozen or more of the going projects, the largest single items being for the planting-out of the available Douglas fir breeding stock, and preparing a new assortment of yellow pine seeds, for trial of both geographic and parentage sources, on the Nebraska. It is hoped that the latter study, with particular reference to the disease and insect-resistance problems, may occupy some of Roeser's time in a field trip during June, but whether or not this

is done will depend on the existence of a balance in District G. E. funds. What is needed at this stage is a survey of the near-by natural stands of yellow pine to determine whether resistant strains have been developed and whether they can be used as future sources of seed for the Nebraska planting. As this involves every question of entomology and pathology, physiology and soil relations, there must be concentrated on it as much expert knowledge as possible.

Whether or not the Nebraska problem receives any special attention at once, considerable work will probably be done during June with the mistletoe-resistant strain of yellow pine at Fremont. Although female flowers have not yet appeared, it is hoped there is going to be opportunity to accomplish some controlled pollination on these trees. This is very important since no cones have yet been available from any individuals of the strain and it is desirable to determine the heritability of the character at the earliest opportunity. Anatomical work will probably be done also to determine the basis for the resistance, which apparently results from development of dry, thick bark, and may possibly be associated with a sub-normal growth rate.

Pacific Northwest Forest Experiment Station

May for most of the organization has been devoted largely to field work. Isaac at Wind River made some current examinations of various reproduction and forestation tests and put in a few new "germination and survival" semi-permanent plots. Then he made a tour of several large logging operations on the lower Columbia River looking for suitable places for putting in more series of plots for study of natural reproduction following logging and burning.

Westveld spent the entire month on the yellow pine brush disposal study working on the operations of the Shevlin-Hixon Lumber Company at Bend, Oregon. Nine temporary, two semi-permanent, and two permanent sample plots were established, and one of last year's semi-permanent plots was reexamined. The two permanent plots lying side by side were established in a virgin stand of timber on the Deschutes Forest which will be logged with caterpillars this summer. On one plot the brush will be piled and burned in the regular Forest Service manner; on the other plot the brush will be left undisposed the same as on private lands.

The Shevlin-Hixon Lumber Company has a more comprehensive fire protection program than ever before. In addition to a lookout, and fire-fighting tools distributed at vantage points, the main traveled roads on the cut-over areas are being cleared of all debris on both sides. The slash is thrown back about ten feet from the road and all needles and other debris raked up so that the bare soil is exposed 6 to 8 feet on each side of the roads.

Most of Simson's time during the month was spent in collecting relative humidity data, making static observations, and obtaining data on the seasonal march of the inflammability of forest fuels.

McArdle spent the entire month working mostly on the Douglas fir yield study. On this project over twenty checks have been made of the various tables and computation of stand tables will begin shortly. An article by him was published in the May 1 issue of the West Coast Lumberman giving the more important results of this study. Reprints of the article are being sent to members of the Advisory Council, Forest Supervisors, and a selected group of lumbermen and timber owners, accompanied by an individual letter.

McArdle and Munger attended the annual meeting of the Oregon Forest Fire Association. About 100 copies of a reprint of Westveld's recent brush disposal article were distributed, mostly to those outside the Service, with an appropriate letter, and quite a number of favorable acknowledgments have been received. Good progress has been made on tabulating and computing the 10-years' accumulation of records on the Douglas fir seed study, but this project is a long way from a publishable progress report still.

Dr. Metcalf of the B. P. I. called to arrange for the visit of Dr. Long to this District to help on the pathological features of brush disposal studies.

RS Manuscript Reports Received

Lake States

The Fight on Forest Pests in the Lake States. S. A. Graham. (American Lumberman)

Develop the Forest Resource. A. E. Wackerman.

Southern

Fire Damage in Virgin Pine Stands. E. L. Demmon.

Naval Stores Yield Tables. Lenthall Wyman. (To Jour. Agr. Res.)

The Identification of the Soils of the Southern Coastal Plain. G. B. Shivery.

Northern Rocky Mountain

Lightning and Forest Fires in District 1. H. T. Gisborne.

District 5

Prediction of the Second Cut - Lassen Lumber and Box Co. Sale. A. E. Wieslander.

Pacific Northwest

A Summary of Statistical Methods. R. E. McArdle.

IN PRINT

The Rocky Mountain Forest Experiment Station (A Leaflet by the Forest Service).

Wyman, Lenthall "Delivering the Goods." Naval Stores Review, May 1, 1926.

Krauch, Hermann. "The Determination of Increment in Cut-over Stands of Western Yellow Pine in Arizona." (Jour. Agr. Res. March 15, 1926).

Hanzlik, E. J. "Sustained Yield for Lumbermen." (West Coast Lumberman. May 1, 1926).

Hanzlik, E. J. "Trees, A Study for Lumbermen; Western Hemlock." (Four L Lumber News. April, 1926).

Sparhawk, W. N. "If you Plan to Plant a Forest, Look up its Ancestors." Forest Leaves, April, 1926.

Kittredge, J., Jr. "Eyes That See and Ears That Hear." (Ames Forester, 1926).

Frothingham, E. H. "The Regeneration of Appalachian Hardwoods." (Proc. of the Southern Forestry Congress, 1926).

Gisborne, H. T. "Forest Fire, a Mother of Invention." (American Forests and Forest Life, May, 1926.)

Weidman, R. H. "Some Principles to Guide the Marking Ax in Western Yellow Pine in the Northwest." (Idaho Forester, University of Idaho, 1926).

GRAZING RESEARCH

Washington

The Junior Range Examiner register has now been received and there are twenty names on it. Several, however, are already in the Service. It appears that including these, twelve names have been asked for, so that there are just eight names still available for consideration.

The Extension Service announced the availability of the revised lantern slide lecture "Range Management on the National Forests," which was prepared and revised by Mr. Chapline.

Eugene Merritt of the Extension Service, during the winter, developed statistics on the source of feed available in each state and these were reviewed by Mr. Chapline with a number of resulting changes. In general, they indicate that pastures and ranges furnish much more feed for the livestock than has generally been appreciated. As a result, the Extension Service plans to strengthen its pasture and range programs. It is planned to check these preliminary statistics with the State Extension workers and Forest Officers this summer and to re-work the material in the fall.

An outgrowth of the tabulations is the possibility of the Division of Crop Estimates of the Bureau of Agricultural Economics endeavoring to work up more material of this character in connection with their yearly estimates. Chapline attended a conference in that Bureau, recently, looking toward the development of suitable schedules.

The "Cow Business," a new movie showing equipment for cattle raising in the West is just being completed by the Extension Service.

Publications

Department Circular 379, "The Use of Salt in Range Management," received last month in galley proof, came back in page proof and has been returned to the Government Printing Office.

Manuscripts received during the month include:

"The Utilization of Mountain Brush Lands in Southwestern Utah as Summer Range for Cattle" by C. L. Forsling and Earl V. Storm; a "Glossary of Common Botanical Terms" by Mr. W. A. Dayton intended for a Miscellaneous Circular for use of Forest officers only; and the outline for the grazing bibliography which Mr. F. G. Renner has been preparing during the winter.

Forage Investigations

The bulk of Dayton's time during the month was spent in necessary revision of the bulletin on Important Western Browse Plants although considerable time was also put in on the joint bulletin, with Mr. M. W. Talbot of the Bureau of Plant Industry, on Southwestern forage plants.

Mr. Tidestrom has been making special effort to push his Flora of Arizona to completion; he hopes to have it finished this summer or by early fall. Mr. Tidestrom's friends will be interested to hear of his recent nuptials to the widow of a French poilu.

Santa Rita Range Reserve

Marketing

Cattle continue in excellent condition for this season of the year with several sales during the month. Both Nicholson and Proctor, cooperators, disposed of their yearling steers at $30 per head. Nicholson also sold 30 head of off-colored cows, among which were eight head of canners, at $35.72 per head; the average weight of these was 893 pounds. Ruelas' long yearlings were sold by weight at 6½ cents a pound and weighed 590 pounds bringing $38.35 per head.

Range Conditions

Although spring annual growth has dried up rapidly during the past month perennial grasses still remain green with every prospect for a bumper crop of forage during the coming summer, providing, of course, that summer rains put in an appearance.

Calf Crop

Calves are coming late this year and both Nicholson and Ruelas will likely show a falling off in numbers as compared with the last few years. From all indications Parker should brand the largest per cent of calves again this year and probably will not fall below his last year's record. During the past few years Parker has consistently sold his increase as calves and this factor has played an important part in keeping his breeding herd in good condition the year round.

Visitors

On the fourth of May Messrs. Cheney of the District 3 office and McKenzie of the Coronado paid a brief visit to the station en route to Nogales.

On the sixth and seventh Messrs. Roak and Oleson of the Coronado stopped over while working the phone line to Mt. Baldy and enlisted the aid of our "Henry" to haul materials along the line. They report her behavior as perfect except that she refused to make the last few feet to the top under her own power and had to be pushed.

On May 25 M. E. Musgrave, Leader of Predatory animal control work in Arizona, stopped over at the station to discuss the predatory animal situation and assured us of help to rid the range of wolves as soon as he could make the necessary arrangements for detailing a man here.

Personnel

Mr. Griffith, now Clerk on the Santa Rita has resigned, effective June 1, to accept a permanent position as Scout Executive over the Kirksville Missouri Council of Boy Scouts of America. He has had considerable experience in Boy Scout work and is admirably fitted for his new duties. His connection with the service started in 1924 when he served throughout the summer as Field Assistant on the Santa Rita. In the fall of 1925 he again returned and has served as technical assistant and clerk up to the present time. His work throughout has been of a highly satisfactory character and we regret exceedingly to lose him. What is our loss, however, is another's gain and we wish him every possible success in his new venture.

Great Basin Experiment Station

Director Forsling and Clerk Walter E. Mann left Ogden on April 21 to start the field season at the Station. They were joined at Ephraim by Nelson, who had gone ahead to start some work on the low range a few days before.

Some of the early work this year included measuring the snow water run-off and sediment eroded from the two watersheds in the streamflow and erosion study. Three previous years' data are available on this phase of the study. The object of this year's data is to obtain information on the effect of .40 of a complete cover of vegetation on one of the areas as compared to a .16 density of vegetation at the time of the previous measurements. Run-off at 10,000 feet elevation started this year earlier than any year heretofore, for which records are available. The first run-off began on April 23. Ordinarily, it has not started until the last few days in April. The month of April generally was characterized by temperatures above normal.

Mr. Nelson is spending most of the month of May gathering the current year's record on plant development during the early stages of growth. This is the third season's records in this project, which should make possible a preliminary analysis on the relation of climate to plant growth in the spring.

Mr. S. B. Locke of the District Office came to the Station on May 20 to re-measure the trees on the Aspen plots which were established by F. S. Baker eleven or twelve years ago. This will be the second re-measurement.

Mr. Forsling returned to Ogden shortly before the middle of the month to complete revision of the two manuscripts which he is preparing for publication. One of these treats with the value of the browse range for summer grazing by cattle in southwestern Utah. The title of the second one is "The Relation of Herbaceous Cover to Run-off and Erosion on High Mountain Watersheds." Some time also will be devoted to compiling data and information on the grazing projects at the U. S. Sheep Experiment Station at Dubois, Idaho ,for presentation at the Annual Field Day, May 31 and June 1, at that Station.

JORNADA RANGE RESERVE

Growing conditions during the month have been very favorable to forage growth. During the latter part of April an average of seven-tenths of an inch of rain was recorded, which was followed by approximately one inch more on the fourth of May. This precipitation was quite general over this part of the state and as a result grass growth is well under way at this time on most types; the Aristidas and some Tobosa have begun to head out. The weed crop is exceptional on all types particularly the grama and where sandy soil predominates. Over twenty-five species of weeds have been in flower this month. Spring growth of this character is very uncommon in this part of the Southwest, this being the second heavy spring weed crop that has occurred here in the past seven years.

Supervisor Scott of the Gila National Forest called at the Office on May 5, and Mr. Parr of the Bureau of Animal Industry was a visitor on May 25, in connection with the Ranch Livestock Survey work being carried on in the Southwest by the B. A. I., B. A. E. and Extension Service. Mr. Shoemaker of the District 3 Office of Grazing visited the Reserve on May 17 as well as the office.

Both Mr. Campbell and the Director attended a local Stockmen's meeting at the State College Ranch adjoining the Reserve on May 15, at which time the results of the data to date were given out on the Range feeding experiment which was begun on the Jornada in the fall of 1924.

The Tobosa and Black grama clipping studies were started on May 18 which is quite unusual, since ordinarily there is not sufficient grass growth to start clipping until the middle of July.

The fence work being carried on by Mr. Waggoner, the Cooperator, in connection with the rearrangement of pastures is progressing in good shape. Pastures 5, 7, 8 and 10 having been completed, work has just begun on the new bull pasture.

A considerable amount of time has been spent in the field this month on pasture inspections, securing spring forage growth data.

DISTRICT 3

The first few days of the month were spent in office work in the "New Office," an attempt having been made to convert a room in a vacant house into office quarters.

A report was compiled on the examination of the smelter smoke damaged area near Clarksdale and Jerome with recommendations for future study.

An additional one-fourth acre enclosure was constructed in the curly mesquite type for the study of volume production. Work was started on the 10-acre erosion study plot on the Crook which is somewhat characteristic of large areas on the Salt River watershed. Quadrats will be established, browse tagged for measurement, and permanent stations for measuring surface change established at 10 ft. contour intervals. Half of the area will be permanently protected and the other half will be grazed periodically on maturity of forage.

A period of 10 days was given to the study of a 100% brush range in the headwaters of Pinto Creek on the Crook. One panel enclosure was fenced and the important browse species of the live oak type were tagged and measured. This range is extremely rough and brushy. It is reached by pack from the copper camp at Miami.

Cooperrider left for Albuquerque the latter part of the month.

FOREST PRODUCTS

Washington

Cooperation - Navy

Negotiations with the Army Air Service and the Navy Bureau of Aeronautics for the preparation of plans for storing aircraft spruce which may be needed in a national emergency were started. Both Army and Navy have realized the need of supplies of aircraft spruce, but have only recently offered financial assistance for the preparation of the plans.

Wood Preservation Statistics

Preparation of the text of this report was started during the month and it is expected that the manuscript will be ready to send to the cooperator, the American Wood Preservers' Association, for printing by the latter part of June.

DISTRICT 1

1925 Lumber Census

The final drive on this project was very successful. There are now but two Montana plants to be heard from. North Idaho is completed, and it is expected that final returns for South Idaho will be received from District IV within the next few days. The last shipment of schedules should be ready for submission to Washington prior to June 15, 1926.

Forest Products Program Conference

During the month Fullaway attended the Annual Program Conference at Madison. The meeting was most successful and has definitely settled several matters affecting the District. It is now planned that a "Properties and Uses" bulletin for western larch will be prepared by the Laboratory during the fiscal year 1927. The District will also attempt to obtain the interest of the local industry in the possibilities of this wood. A Departmental bulletin on the "Air Seasoning of Western Softwoods" based on the investigations by Districts 1, 5, and 6 is to be written during the coming year. District One will be responsible for its preparation, with Districts 5 and 6 cooperating.

Lumber Prices and Movement

	Annual 1925	First Q. 1926	April 1926
Idaho white pine	$37.37	$37.10	$37.33
Western yellow pine	28.02	29.33	28.79
Larch-fir	19.33	19.33	18.33
White fir	20.14	19.79	19.88
Spruce	24.28	23.60	25.37

	April, 1925	April, 1926
Shipments	135,019 M	137,079 M
Cut	163,137 M	155,465 M

ECONOMICS

World Forestry Congress

Sparhawk attended the World Forestry Congress at Rome (April 29-May 5). Besides Dana, Hunt, and Guthrie of the Forest Service there were about 15 other American delegates. The total registration was eight or nine hundred from some 60 countries. About 250 papers on various phases of forestry were prepared for the meeting, including 6 from this country, though not all were read nor was time available for adequate discussion of those that were presented. Sparhawk read a paper on "Public responsibility in the re-forestation of denuded land."

One of the principal subjects discussed was the proposal to establish an organization for the collection and dissemination of world-wide statistics on forest resources and consumption and trade in forest products. Papers on this subject were presented by delegates from half a dozen countries, and a set of recommendations drawn up by a committee of several of the principal producing and consuming countries was finally approved by the Congress. It is proposed that a Bureau of Forestry Statistics be established in the International Institute of Agriculture at Rome, which is already doing something along this line and has special facilities through its treaty relations with nearly all countries. Each country, of course, will collect its own statistics; the function of the Bureau will be to encourage the collection of statistics by countries which do not have them, to work for uniformity in definitions and methods so that statistics from different countries may be comparable, and to correlate, combine, and publish the results. It is estimated that such a bureau should cost about a million lire ($40,000) a year, although it can start on $20,000. It was recommended that the funds be obtained from the Governments and from industries and individuals of the chief producing and consuming countries, and that the countries furnishing the money should nominate the men to carry on the work. Special emphasis was laid on the desirability of putting the work in charge of fully qualified forest economists, whose technical activities should be entirely free from domination or interference by political or other influences.

Other resolutions favored increased acquisition of private forest land by public bodies and a greater degree of intervention by the public in the handling of private forests, not only for physical (protection) but also for economic (timber supply) reasons. It was urged that the public should endeavor to increase the yields of private forests, especially through assistance to and cooperation with the owners. A point made by one speaker, and reflected in a resolution, was that forest regulation so far has been mainly along the line of restricting consumption; now it is time to work from the other end, that of increasing production through more scientific silviculture. The International Institute was requested to prepare for the next Forestry Congress a summary of existing legislation dealing with public intervention in the management of private forests,

and also a summary of forest taxation methods in different countries. One resolution favored a tax on the soil revenue, exempting the accumulated timber stand, with a special tax on cutting more than 30 per cent in excess of the annual increment.

The growing importance of the forests of the Tropics was indicated by the presence of delegates from about 20 tropical countries and by a number of interesting papers. It was voted that the next Congress be held in some tropical country.

Following the Congress, Sparhawk spent a few days in Switzerland, where several cantonal, communal and private forests were visited. The Federal Government does not own any forest, but exercises a large degree of control over all the forests of the country. The cantons (states) own only 5 per cent of the forest land, while 67 per cent belongs to cities, towns, villages, and other public bodies. It is considered that the universal popular regard for the forests is due to this localization of public ownership; almost everyone has a direct personal interest in seeing that the forests are maintained. Some of the town councils are so conservative that they insist on keeping trees which the state foresters wish to mark for cutting. Forestry and agriculture are very closely tied together; much of the land that is now farmed would have to be abandoned if it were not for the wood and the work afforded by the forest, while the forests would not pay as well as they do if it were not for the large local wood-using population. In many rural districts of Switzerland the per capita consumption of wood is apparently as large as in similar regions of the United States.

The large amount of capital represented by a going forest is particularly striking. One village is buying farm land at $75 an acre to plant trees, while the average stand on its existing forest is about 5,600 cubic feet per acre (about 30 M board feet). Another communal forest near by has an average stand of over 40 M feet and cuts 126 cubic feet per acre per annum (considerably less than the annual increment). During the last 10 years this forest has paid an annual net return of $19.50 an acre, the highest in Switzerland.

The cut on most of the Swiss forests is regulated by the "control" method instead of by formula. The entire stand is calipered (all trees over 6 inches DBH) at ten-year intervals, and the cut is based on the increment thus determined. It is interesting to note that the Swiss apparently do not believe in compound interest in forestry. All charges for planting, roads and other improvements, taxes, and other costs are written off currently against the revenues.

Sparhawk also spent a few days in England, visiting one of the large reforestation projects in Norfolk and the New Forest in Hampshire. Conditions in the eastern counties resemble in some respects the pine plains of the Lake States, with large tracts of level, sandy land suitable for

growing pine, and a decreasing agricultural population. The British Government is acquiring land by lease or purchase and is planting on a large scale. Costs are rather high because of the necessity of fencing all plantations with rabbit proof fences. Most interesting is the development of small agricultural holdings on the forests. Small tracts of the better land are leased to the small holders, along with buildings, and they are guaranteed six months' work each year in planting and other forest operations. In this way several of the communities that had lost most of their population have already been restored to comparative prosperity, and a settled supply of local labor is ensured for forest work.

At the request of Lord Lovat, a couple of days were spent in the offices of the British Forestry Commission in London, for the purpose of helping in the revision of the statistical questionnaire on forest resources and trade which is to be submitted to the various units of the Empire before the next Empire Forestry Conference. Great Britain herself is just completing a forest census, which covers areas classified by types and age classes, and production by species and classes of material.

Forest Land About Large Cities

How intimately forestry is tied in with the local industry of large metropolitan districts is shown by the large percentage of forest land in the territory immediately surrounding certain large cities. In an area of fifty miles radius about Pittsburgh, 32 per cent of the total land area is forest land, about Albany, N. Y., 48 per cent, about Springfield, Mass., 55 per cent. A similar area about Chattanooga, Tenn., reveals forest land to the extent of 63 per cent. Even about Cincinnati, the center of a large and prosperous agricultural region, 14 per cent of the total land area is forest land.

LUMBER, FUELWOOD AND POSTS

The lumber industry is staging a remarkable recovery in regard to the volume of production. From 1911 to 1921 the production curve fell steeply from 45 billion feet to 27 billion feet. Since 1921 the upward trend has been just as marked as the previous fall. Preliminary figures released by the Census showing the cut of 608 identical large mills indicate an increase of 11 per cent in 1925. If this percentage holds the 1925 cut will be recorded at about 40 billion feet. This total is the more remarkable because it is based on reported figures. The greatest cut ever reported was 44,509,761 M feet in 1909, when 46,584 mills were canvassed. At present the canvass covers only about 15,000 mills. The peak of production was set at 46 billion feet in 1907, by official estimators who considered the reported figures of that period too small.

Considering their important ranking in the "Drain Table" there is a woeful lack of reliable figures for fuelwood and for posts. We have groped for understanding of the trends of consumption and production, with results which may have been very erroneous. Many estimates have been very erroneous. Many estimates have been made by crop reporters of fuelwood and posts consumed or produced on farms, but they have been of very doubtful use because there were no multipliers that could be used with confidence to get either total production or total consumption. Obviously not all farms consume cordwood in quenaity, although practically all farms use posts. Obviously only farms having wooland can produce either fuel or posts, but many of those having woodland do not do so. However, the trend of production and consumption of both fuel and posts is downward, and strikingly so in the case of fuel.

According to our admittedly imperfect figures the situation has been something like this:

Fuelwood

Year	Production		Consumption	
	On Farms	Total U. S.	On Farms	Total U. S.
	Cords	Cords	Cords	Cords
1880	...	146,000,000	...	146,000,000
1908	...	78,000,000	62,000,000	78,000,000
1923	[1]36,000,000	[2]50,000,000	33,000,000	[3]50,000,000

Imports and exports are relatively unimportant, the latter decreasing notably in recent years. Farm production is probably greater than farm consumption. For that reason, it may be that the farm consumption of wood fuel is now no more than half what it was in 1908, and the total consumption less than 50 million cords. The "Drain Table," which is the basis of many economic estimates, allowed 100,000,000 cords.

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[1]Based on Bureau Agricultural Economics averages, modified by partial reports from 1925 Census of Manufactures.

[2]Same as total consumption.

[3]Based on farm production and its relation to total consumption in previous years.

This apparent decrease of fuelwood on the increased number of farms may either paint a sad picture of devastation in the woodlots, or indicate that coal is cheaper than the labor of cutting cordwood. Fortunately, we shall soon have reported figures of fuelwood consumed on farms, from the 1925 Census of Agriculture.

An unpublished report of the Forest Service made in 1908 gives 889,834,000 posts as the number consumed on farms in that year. This quantity is probably too high by one-ninth as the estimated number of farms used in computation was in error. Possibly the farms used 790,000,000.

According to our uncertain figures for 1925 the consumption on farms was 685,000,000 posts, while the farm production was 185,000,000, both figures being probably too large. Can it be possible that our farm woodlots produce only one-fourth of the posts our farms need? Here we must think of prairie farms, concrete posts and the people who make a business of producing posts.

Considering the number of posts used elsewhere than on farms it appears that the "Drain Table" figure of 900,000,000 is less vulnerable than the fuelwood figure. Consumption of posts per capita on farms is about 20. Fifty-four million people were urban dwellers in 1920. If we allow one-tenth as many posts per capita in town as on farms we should add 108,000,000 posts to the farm consumption. The total consumption would then be not to exceed 800,000,000 posts.

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